

# COVID-19 IMPACT STUDY ON TENNESSEE AGRICULTURE

Department of Agricultural & Resource Economics

## Economic Impact Methods Employed to Estimate Regional Impacts

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AREC Covid #FS01

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Many of Tennessee's agricultural and forestry sectors have experienced a combination of reduction in demand and market supply chain disruptions during the COVID-19 pandemic.<sup>1</sup> The exact short- and long-run impacts of the pandemic are currently emerging and, consequently, a challenge to predict. The markets for agricultural, processes agricultural output (food and otherwise), and forestry and forest-based products are undoubtedly being affected but to an unknown degree. Impacts on important but related topics including food safety, household food security, and labor supplies to support agri-forestry industries are also unknown.

The University of Tennessee's Department of Agriculture and Resource Economics is developing a series of fact sheets to provide industry leaders, policymakers, and other researchers with information regarding possibly short-term impacts of the pandemic on economic activity in the state's agri-forestry complex, as well as resulting changes in economic activity for the rest of the state economy (i.e., the complex's multiplier effect). Restating, we will *estimate* the pandemic's impacts on various parts of the Tennessee agri-forestry industrial complex and, in turn, provide estimates of resulting changes in other part of the state economy.<sup>2</sup>

Tennessee's agri-forestry industrial complex includes primary agricultural and forestry industries such as crop, livestock, and timber production. Also included are industries that supply inputs to farming and forestry (such as fertilizer manufacturers) and industries that process or add value to crops, livestock, and forestry (i.e., food and beverage manufacturing, apparel and textiles producers, and forest products manufacturing). Accounting for the multiplier effects, in 2018 the agri-forestry industrial complex directly and indirectly contributed \$79.3 billion in output to the Tennessee economy, or 10.9 percent

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<sup>1</sup> The coronavirus disease 2019 (COVID-19) is caused by the severe respiratory syndrome coronavirus 2 (SARS-CoV-2).

<sup>2</sup> Primary data will be used if available for the analyses, but due to the changing dynamics of the virus, secondary data sources and/or assumptions may be used as warranted and are specific to each factsheet. For example, the analyzed time period will be specific and variable across the different fact sheets (i.e., the period of analysis will be specified for the part of the agr-forestry complex being examination). Further, impacts will only be for the time period specified in the factsheet and could well continue beyond that timeframe.

of the state’s economic activity (Menard, English, and Jensen, 2019).<sup>3</sup> The complex resulted in estimated employment of over 339,400 individuals, or 8.4 percent of the total number of workers. Tennessee’s agri-forestry industrial complex accounted for 8.1 percent of the state’s economy and generated \$58.9 billion in output and employed close to 255,000 Tennesseans, including over 95,600 full- and part-time farmers (Menard *et al.*, 2019).

The input-output model, *IMPLAN*<sup>®</sup> (Version 3.0 using basic data for 2018) will be employed in estimating the economic impacts of the COVID-19 pandemic on the state economy as a result of changes in economic activity for various parts of the Tennessee’s agri-forestry industrial complex. Like all input-output models, *IMPLAN* describes the buying and selling of products and resulting transfer of money between different industries in the Tennessee economy, these industries use of workers and capital (factors of production), their use of inputs from outside the state (domestic and foreign imports), and their sales to institutions (in-state consumers, entities outside of Tennessee, and various forms of government). Output from the model provides descriptive measures of the economy including total industry output (the value of all sales), employment, labor income, value-added, and state/local taxes for 544 industries in the Tennessee economy.<sup>4</sup>

The state *IMPLAN* model can also provide estimates of multiplier-based impacts (for example, how changes in sales by the Tennessee meat processing industry caused by COVID-19 will also impact the rest of the state economy). In analysis of the impacts of the complex, the indirect multiplier effect (i.e., the impact on the non-agricultural part of the economy in this case) is also included. Multipliers operate on the assumption that as consumers and institutions increase expenditures, demand increases for products made by local industries who in turn make new purchases from other local industries and so forth. Stated another way, the multipliers in the model will measure the response of the entire state economy to a set of changes in production for specific Tennessee agricultural and forestry sectors as a result of the pandemic.

## Reference

Menard, J., B. English, and K. Jensen. 2019. “Economic Contributions of Agriculture and Forestry in Tennessee, 2017.” Available at <https://ag.tennessee.edu/arec/Documents/publications/FullRpt2017.pdf>.

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<sup>3</sup> A list of the industries comprising the agri-forestry complex can be found in Menard *et al.*, 2019.

<sup>4</sup>**Total industry output** is defined as the annual dollar value of goods and services that an industry produces. **Employment** represents total wage and salary employees, as well as self-employed jobs in a region, for both full- and part-time workers. **Labor income** consists of employee compensation and proprietor income. **Total value added** is defined as all income to workers paid by employers (employee compensation); self-employed income (proprietor income); interests, rents, royalties, dividends, and profit payments; and excise and sales taxes paid by individuals to businesses. **State/local taxes** are comprised of sales tax, property taxes, motor vehicle licenses taxes, severance taxes, and other taxes.